

100 THE BASIC OPEN-HEARTH STEEL PROCESS

inoperative. It is then, however, able to be again renewed by partially or totally shutting off the steam, and blowing the producer hot again by means of dry air. There has been no statement hitherto under discussion bearing on the advantageous thickness of the incandescent bed. The sizes of the lumps of fuel and their behaviour under, and the extent of their caking, has a decided influence. From some old data, the thickness of the bed of fuel above the step fire bars, should amount to 600 millimetres to 1 metre ; still this might not suffice for the most perfect possible prevention of CO_a making its entry into the steam-air gas with the forced working of the present time. There is, however, opposed to increasing the depth of the bed of fuel, the resistance, which obstructs the passage of the air for gasifying, and this resistance can be easily overcome by means of the employment of a more powerful blast. A steam jet blast, however, might not be able to be regulated correspondingly to the demands of producer working. Recently, Bone and Wheeler have published experiments with producers in "Metallurgie," 1908, pp. 686 and 687, wherein they give the statement that they gave the bed of fuel a thickness of 2*13 metres, but they were able to go down to 1*06 metres, after they had reduced the steam content of the air supply for gasification. The authors give also an ideal means whereby one may voluntarily set up and maintain at equal height this steam content. They employ air, which is maintained at a constant specified temperature, saturated with moisture. The best results were obtained if the temperature amounted to 45°, whereby the gas contained 36*95 per cent, of carbon-containing gas.

STEAM CONTENT OF PRODUCED GAS.

Producer gas always in practice contains steam, since the entire hygroscopic water, as well as the greater portion of the so-called chemically combined water, is carried over as steam into the gas.

As shown, the content of steam from the hygroscopic water of the fuel is able to amount in a good gas coal to 0*2 kilo-